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To obtain the relative values between the two sets of values (10) and (11), take $(6) \times 1703 - (9) \times 131$, results in $9a = 4d$. $\therefore a = 4$ and $d = 9$, $b = 5$ and $c = 6$. These are prime to each other. \therefore are the least values.

III. Solution by COOPER D. SCHMITT, M. A., Professor of Mathematics, University of Tennessee, Nashville, Tennessee.

The equations can be written: $50\left(\frac{1}{a} + \frac{1}{b}\right) = 81\left(\frac{1}{c} + \frac{1}{d}\right)$,

$$56\left(\frac{1}{c} + \frac{1}{a}\right) = 75\left(\frac{1}{b} + \frac{1}{d}\right), \quad 65\left(\frac{1}{b} + \frac{1}{c}\right) = 66\left(\frac{1}{a} + \frac{1}{d}\right).$$

Let $1/a = x$, $1/b = y$, $1/c = z$, and $1/d = u$, and the equations become $50x + 50y - 81z - 81u = 0$; $56x - 75y + 56z - 75u = 0$; $66x - 65y - 65z + 66u = 0$.

Thus we have three equations with four unknown quantities.

By determinants $x : y : z : u ::$

$$\begin{vmatrix} 50, & -81, & -81 \\ -75, & 56, & -75 \\ -65, & -65, & 66 \end{vmatrix} : - \begin{vmatrix} 50, & -81, & -81 \\ 56, & 56, & -75 \\ 66, & -65, & 66 \end{vmatrix} : \begin{vmatrix} 50, & 50, & -81 \\ 56, & -75, & -75 \\ 66, & -65, & 66 \end{vmatrix} : - \begin{vmatrix} 50, & 50, & -81 \\ 56, & -75, & 56 \\ 66, & -65, & -65 \end{vmatrix}$$

Evaluating the determinants, we have,

$$x : y : z : u :: (131)^2 90 : (131)^2 72 : (131)^2 60 : (131)^2 40,$$

$$\text{or } x : y : z : u :: 90 : 72 : 60 : 40.$$

$$\text{Hence } 1/a : 1/b : 1/c : 1/d :: 90 : 72 : 60 : 40,$$

$$\text{or } a : b :: c : d :: 4 : 5 : 6 : 9;$$

whence $a = 4$, $b = 5$, $c = 6$, $d = 9$ are the lowest values.

Also solved by A. H. HOLMES.

PROBLEMS.

47. Proposed by EDMUND FISH, Hillsboro Illinois.

A rectangular field, whose length and breadth in rods are in whole numbers, is enclosed with a fence and subdivided by fences on both diagonals, the total length of the fences is 2204 rods; required the sides and area.

48. Proposed by SYLVESTER ROBBINS, North Branch Depot, New Jersey.

The edges of a rectangular parallelopiped are within 1 of the proportion $2 : 3 : 9$, and they are $2x \pm 1$, $3x$ and $9x$, $(2x \mp 1)^2 + (3x)^2 + (9x)^2 = \text{the diagonal squared} = 94x^2 \mp 4x + 1 = \square$. To find four integral values for x .